ART. XVII.—*On Extensive Infusoria Deposits in the Mallee Scrub, near Swan Hill, on the Lower Murray River, in Victoria; and, on the Presence of Fucoidae in Silurian Rocks, near Melbourne.* By WILLLIAM BLANDOWSKI, ESQ.

WITH ONE PLATE.

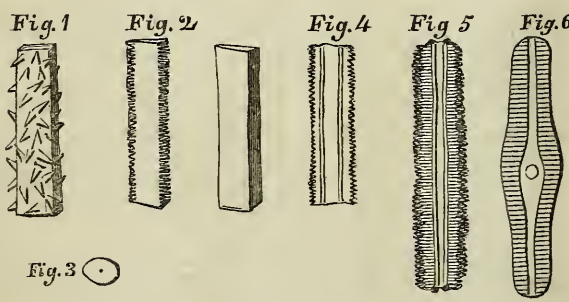
[Read before the Institute, 11th November, 1857.]

WHEN passing Swan Hill, on my late excursion to the Lower Murray, Mr. Beveridge drew my attention to an extraordinary geological formation in the Mallee Scrub. He accompanied me in the middle of summer for about twenty or twenty-two miles, in a westerly direction from his residence. We travelled under a burning sun; not a single drop of water was to be found on the whole journey, but only dense bushes of Eucalypti dimosæ, with low sandy limestone ranges alternating with dried up grassy open patches of good land, sometimes of a few miles in extent, which relieved the weary minds of the riders. Now and then a Leipoa started from the dense brushes, or a lizard from the sandy places, but not a single kangaroo interrupted the monotony of the scene. The rapidity with which we rode compelled us to keep a sharp look-out for all branches and crooked stems of the Mallee Scrub, to avoid serious accidents. We, nevertheless, arrived sooner at our destination than I had expected.

Here, low dry channels wound their course to the N.W. for an apparently indefinite distance, through a dreary-looking country, in which scarcely any vegetation covered the sterile slightly undulating ground. Suddenly our horses were plunging through a brownish black crust into a pale yellow mass of flour-like mineral. Clouds of dust surrounded horses and riders, leaving a deep track behind along their route, similar to that we should have made on crossing a slightly frozen shallow lagoon. Every step of our horses formed a separate mark on the ground. I examined the mass under our feet. I dug with my hands a deep hole and tied up about twenty pounds of it in my pocket handkerchief, and sent a bagful as a specimen for our National Museum, which was delivered some time ago to that Institution, and numbered 1172.

I recognised in this flour-like, fine powdered earthy mass of a pale yellow uniform colour, the well-known "Kieselguhr" or "Bergmehl," of the German mineralogists; but, not having a

powerful glass with me, I postponed a closer examination of it until a short time ago. The mineral, loose in itself, is like a kind of flour, and forms an extensive belt of many miles in length by a width of from one quarter to one mile, and a depth of many feet; soft, and a little soapy to the touch; is not affected by acids; and, when exposed with soda to the blow-pipe, it rapidly moves on the surface of the soda pearl, suddenly dissolves and unites with it forming a kind of glass. Under a magnifying lens of 350 diameters, this powder has the appearance of elongated flat bodies, ornamented with triangular spurs irregularly projecting in every direction. (Vide fig. 1.) Some specimens only have a rugged appearance on both sides (vide fig. 2), and not unfrequently small round bodies with a spot in the centre. (Vide fig. 3.) This is all that I could detect.



Mr. Foord, chemist in Mr. Clarke's Assay Office, in Elizabeth-street, has given me his aid in these examinations; and, as he had a specimen of a similar mineral, forwarded to him by a digger at Albury, we compared his sample specimen with mine; but the forms exhibited by it were without the pyramidical triangular spurs (vide fig. 4), and only slightly rugged on the outer margin of the body of the Infusorium. In this inner part I observed on each side two lines forming, as it were, a channel longitudinally through the body of these little animals.

Professor Ehrenberg's work on the Infusoria has just arrived at the public library, and at page 191, sec. 254, you will see Eunolia granulata (vide fig. 6) very nearly identical with

the specimen obtained near Albury and belonging to Eunotia or Eunotie genus (Prachtshiffchen). It is found in the moors of Germany at Franzensbad but not alive, in a fossil state at Santafiora, and under similar circumstances to those in the Mallee Scrub.

Ehrenberg says, that these Eunolia Infusoria are distinguished by having elongated bodies with independent movements or by single or double bodies, having single, double, or more shells of a prismoid shape, which seldom form more than two or four joined chains, having four openings or two on each side; on the neutral side flat, on the dorsal side convex, and very often prettily indented.

There are three of these families alive, and ten fossil specimens have been found since 1837, when this genus was first discovered in Siberia.

The specimen obtained by me in the Mallee Scrub will surely interest men of science like Professor Ehrenberg, as being imbedded in our Australian Upper Tertiary formation and forming another connecting link in that chain of strata which I had the honor to delineate in my 2nd Report to you for 1854, and published in the Transactions of the Institute for 1857, page 32, Nos. 1, 2 and 3. I therefore beg to communicate through you to the scientific world these observations as one of those small results of my investigations of this year in our desert, particularly as Mr. Foord believes they arise from stagnant pools in which a great mass of the green confervaceae is formed, and that if the latter are carefully dried, burnt and the ashes exposed to view under a powerful glass; similar siliceous forms would be seen. Dr. Sconce and I have made experiments which showed us similar bodies, but after consulting Lindley's Vegetable Kingdom, I cannot agree with Mr. Foord's hypothesis as applicable to the case in question. The result of my inquiries has convinced me that such an enormous mass of siliceous molecules could not have been aggregated as the result of the igneous destruction of confervae. First, because they contain so small an amount of silica; and second, because the ashes of burnt or desiccated confervoid growth would have been dispersed by the winds. The substance I am describing contains a large quantity of silica, and the boundaries of the mass are comparatively defined.

The great importance of such a geological phenomenon is evident. I believe that organic life has alone caused these enormous deposits of infusorial masses. Considering that only 30 years have elapsed since minute scientific investigations into this

department were made, and believing that little is known as to what share organic life has had in the alteration of the component parts our globe, I conceive that any addition to our stock of information on this subject must prove acceptable.

The celebrated Professor Ehrenberg, of Berlin, whose pupil I am proud to have been, informs us that one cubic inch of such earth contains more than 41,000,000 of individuals. One species is able to produce in a few hours one million of others, and in four days some species produce 140 billions or 2 cubic feet of solid stone, taking an abstract view of the question. This animal moves at the rate of one mile in four weeks. One hundred millions weigh about one grain.

They have the qualities of organised animal life. Reflect upon the difference of size of such a minute creature as compared with planets, with the velocity and size of any of which bodies, what extremes of magnitude, what difference of purpose and function are presented for the reflection of the philosophic student of nature. On the one hand we have microscopic organisms so minute that although their size may be expressed in figures, the mind is unable to appreciate the minuteness of their structure; on the other hand, we have bodies whose proportions are so gigantic that the mind vainly endeavours to grasp the idea of their magnitude. But if you consider that each animal has its parasite, how much smaller must be the lice which prey and live upon these little infusoria, and which lice, says Ehrenberg, are again covered with still infinitely smaller parasites, which consider the backs of the lice their natural home. These little animalculæ form here in our Mallee Scrub for hundreds of miles, a deposit of such an extent that we shall be compelled at some fure day to acknowledge its existence as a formation on our geological maps!

You will, I hope, forgive me if I connect another observation of mine with the present one, which if not distinctly appertaining to our subject, is nevertheless connected with it, and which I have made only a few days ago in the Silurian strata near Melbourne, viz., the existence of fucoidae in a fossil state, of which I have the honour to lay before the members of this Institute a magnificent specimen. As it is exactly sixteen years ago since I discovered the first fucoidae in the limestone of Tarnowitz, in Upper Silesia, belonging to the Upper Trias Formation, and which are now in the possession of Professo Goeppert in Breslau, I feel assured you will excuse me if I inform you of a few details concerning them.

Five years ago I found the first fossils in our Melbourne

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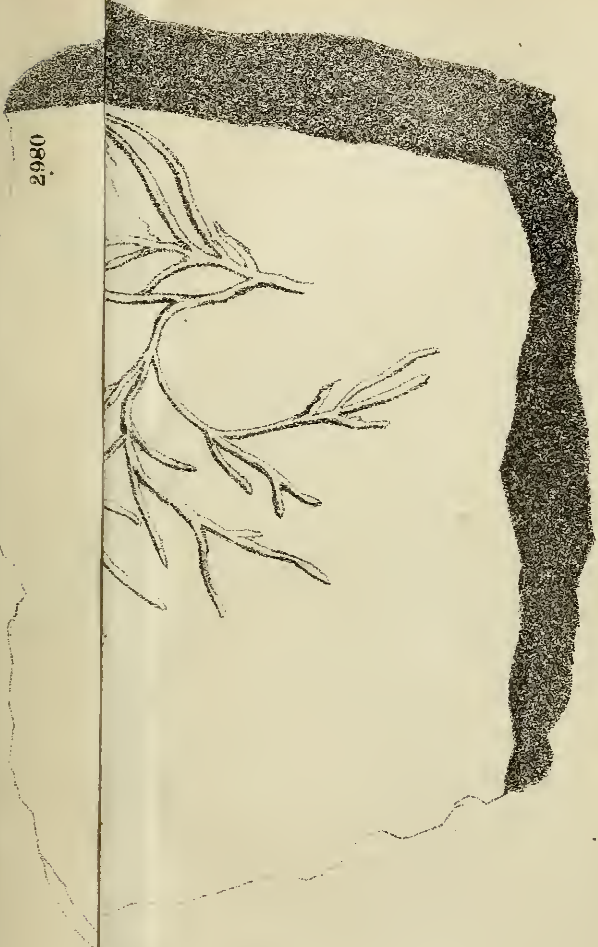

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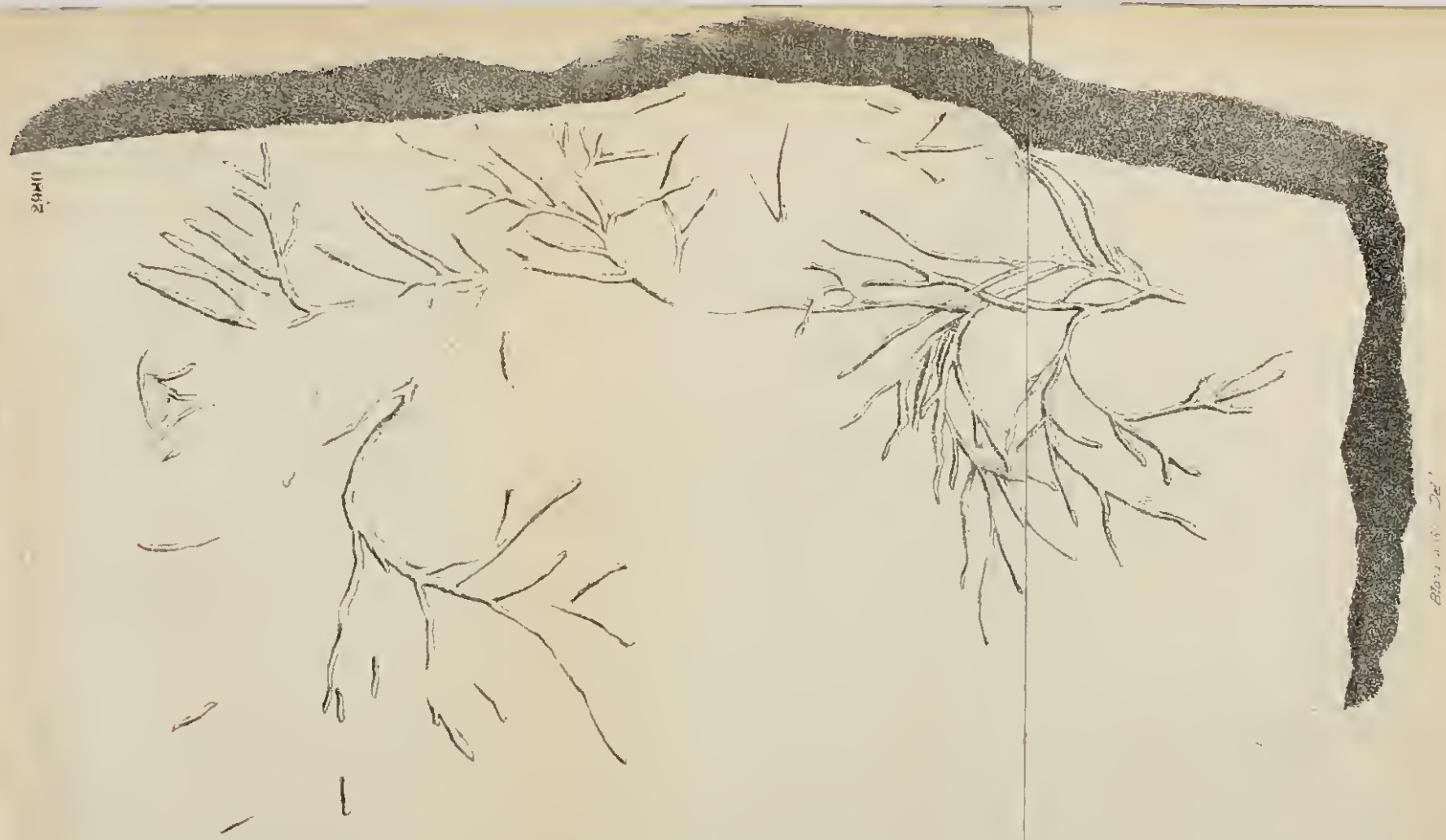

FUCOIDEÆ in pale yellow micaceous slaty sandstone of the Cambrian or Lower Silurian formation
Discovered at the **BOTANICAL GARDENS** *Melbourne, by W. Blandowski, Nov. 11th 1857*